

IN THE CLAIMS:

- 1 1. (Original) A network device to identify a non-adaptive flow, comprising:
 - 2 a processor executing first instructions to drop packets on a random basis using a
 - 3 RED algorithm;
 - 4 a classifier to read indicia of a selected flow from at least one field of a header of
 - 5 a packet received by said device;
 - 6 a processor executing second instructions to calculate a drop interval for packets
 - 7 of said selected flow dropped by said RED algorithm, in response to a time at which said
 - 8 packets were dropped; and,
 - 9 a processor executing third instructions to apply a statistical test to drop intervals
 - 10 of a plurality of flows in order to identify said non-adaptive flow.

- 1 2. (Original) The apparatus of claim 1 wherein said processor executing said second in-
 - 2 structions to calculate a drop interval for packets of said selected flow dropped by said
 - 3 RED algorithm further comprise:
 - 4 said processor executing said second instructions to calculate said drop interval by
 - 5 subtracting from a first time at which the most recently received packet was
 - 6 dropped, a second time at which an earlier dropped packet was dropped.

1 3. (Original) The apparatus of claim 1 wherein said processor executing third instruc-
2 tions to apply a statistical test, further comprises:

3 a processor executing fourth instructions to calculate a median drop interval for
4 said selected flow, said median drop interval having one half of the drop intervals larger
5 than said median and having one half of the drop intervals less than said median; and,

6 a processor executing fifth instructions to compute a statistical difference by sub-
7 tracting 0.693 times said average drop interval from said median drop interval, and in the
8 event that said statistical difference exceeds a selected threshold, identifying said selected
9 flow as a non-adaptive flow.

1 4. (Original) The apparatus as in claim 3 further comprising:

2 a processor executing sixth instructions to compute a "departure from exponential
3 mean" (DEM) value, said DEM value computed by subtracting from said 0.693 times
4 said average drop interval, said median drop interval; and,

5 a processor executing seventh instructions to compare said DEM value with the
6 number 0.5, and in the event that the DEM value is within a preselected range of 0.5, to
7 identify said flow as non-adaptive.

1 5. (Original) The apparatus as in claim 4 wherein said preselected range is between 0.45
2 and any number larger than 0.5.

- 1 6. (Original) The apparatus as in claim 4 further comprising:
2 a processor executing eighth instructions to select said preselected range dynami-
3 cally in response to DEM values of selected flows.
- 1 7. (Original) The apparatus as in claim 6 further comprising:
2 a processor executing ninth instructions to select said selected flows as a subset of
3 all flows, said subset having selected values of DEM less than a largest value of DEM
4 computed in a set of flows.
- 1 8. (Original) The apparatus as in claim 1 wherein said network device is a router.
- 1 9. (Original) The apparatus as in claim 1 wherein said network device is a switch.
- 1 10. (Original) A method of operating a network device, comprising:
2 dropping packets on a random basis using a RED algorithm;
3 reading indicia of a selected flow from at least one field of a header of a packet
4 received by said device;
5 calculating a drop interval for packets of said selected flow dropped by said RED
6 algorithm, in response to a time at which said packets were dropped; and,
7 applying a statistical test to drop intervals of a plurality of flows in order to iden-
8 tify said non-adaptive flow.

1 11. (Original) The method of claim 10 further comprising:

2 calculating said drop interval by subtracting from a first time at which the most
3 recently received packet was dropped, a second time at which an earlier dropped packet
4 was dropped.

1 12. (Original) The method of claim 10 further comprising:

2 calculating a median drop interval for said selected flow, said median drop inter-
3 val having one half of the drop intervals larger than said median and having one half of
4 the drop intervals less than said median; and,

5 computing a statistical difference by subtracting 0.693 times said average drop
6 interval from said median drop interval, and in the event that said statistical difference
7 exceeds a selected threshold, identifying said selected flow as a non-adaptive flow.

1 13. (Original) The method of claim 10 further comprising:

2 computing a "departure from exponential mean" (DEM) value, said DEM value
3 computed by subtracting from said 0.693 times said average drop interval, said median
4 drop interval; and,

5 comparing said DEM value with the number 0.5, and in the event that the DEM
6 value is within a preselected range of 0.5, to identify said flow as non-adaptive.

1 14. (Original) The method of claim 10 further comprising:

2 selecting said preselected range between 0.45 and any number larger than 0.5.

1 15. (Original) The method as in claim 13 further comprising:

2 selecting said preselected range dynamically in response to DEM values of se-
3 lected flows.

1 16. (Original) The apparatus as in claim 14 further comprising:

2 selecting said selected flows as a subset of all flows, said subset having selected
3 values of DEM less than a largest value of DEM computed in a set of flows.

1 17. (Original) The method of claim 10 further comprising: executing said method in a
2 router.

1 18. (Original) The method of claim 10 further comprising: executing said method in a
2 switch.

1 19. (Original) A computer readable media having written thereon instructions for prac-
2 ticing the method of claim 10.

20. (Original) Signals transmitted over a computer network having encoded therein in-
structions for practicing the method of claim 10.